

## A NEW SPECIES OF *LEUCADENDRON* (PROTEACEAE) FROM THE OUTENIQUA MOUNTAINS\*

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### ABSTRACT

A very distinct new species of *Leucadendron* is described for the first time.

### UITTREKSEL

'N NUWE SOORT *LEUCADENDRON* (PROTEACEAE) VANAF DIE OUTE-NIEKWABERGE

'n Nuwe baie duidelik onderskeibare *Leucadendron* soort word vir die eerste maal beskryf.

***Leucadendron olens*** Williams, sp. nov. propria propter monomorphophylla, inflorescentiam maris 9 mm diam. auream fragrantem, inflorescentiam feminae 5 mm diam. ad apice bi-, tri-floriferam.

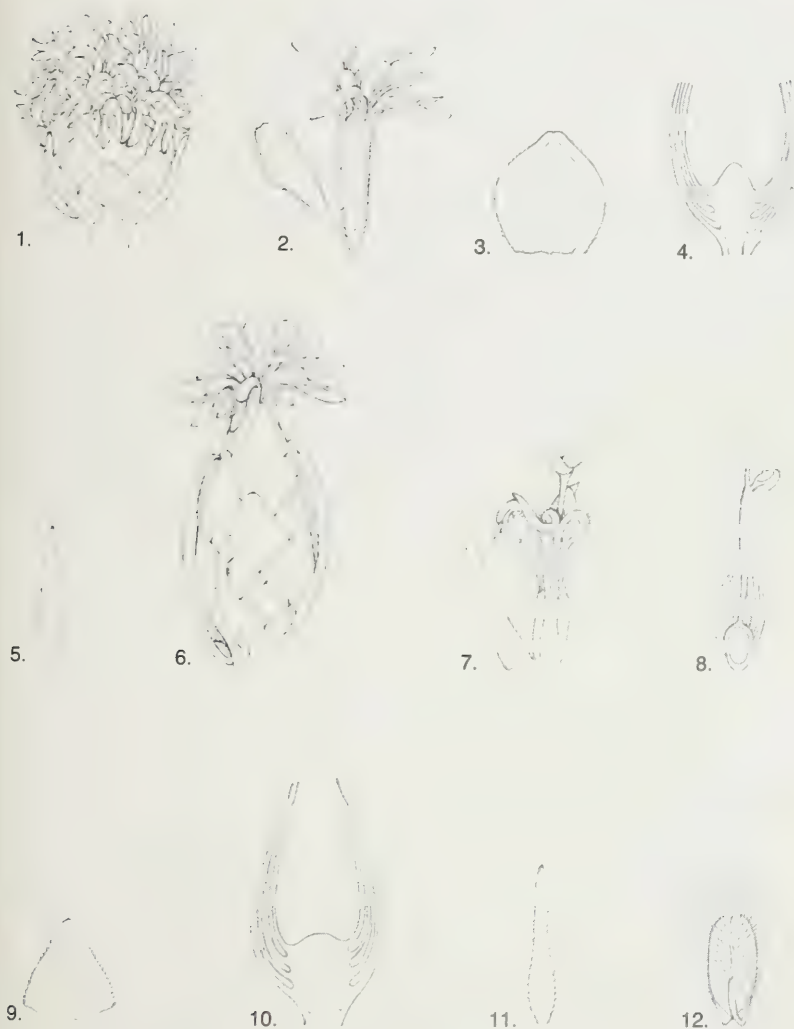
*Frutex* 1,2 m altus, monocaulis, rectus. *Rami* recti, pauci, glabrescenti, rubelli. *Ramuli* fasciculati, graciles sparsim puberuli. *Folia* 7-11 mm longa, 1,2-2 mm lata, lineari-lanceolata, acuta, mucronata, glabra, coriacea, initio sparsim villosa-ciliata, alterna, adpresso-erecta, incurva. *Inflorescentia* maris 9 mm longa, 8 mm diam., solitaria, terminalia, flavida, valde suaveolens. *Bractae basales* varians, 4,2 mm longae, 3,3 mm latae, ovatae, glabrae, ciliatae. *Bracteola* 5 mm longa, 1,2 mm lata, lineari-spathulata, ciliata, costa villosa. *Tubus perianthii* 4 mm longus, crispo-pubescens, stylo connato. *Unguis* 1,7 mm longus, pubescens. *Limbus* 1,7 mm longus, linearis, glabrescens. *Anthera* 1 mm longa, linearis, mox sine pollen. *Pollen* 42  $\mu$  diam., siccus. *Stigma abortivum* 1,5 mm longum, clavatum, bifidum. *Stylus* 2 mm longus, filiformis, glaber, deflexus. *Squamae hypogynae* nullae. *Receptaculum* 1,8 mm diam., globosum. *Inflorescentia feminae* 5 mm diam., solitaria, terminalia conico-ovoidea, acuta, bi-, tri-florifera. *Bractae basales* varians, 6 mm longae, 6 mm latae, deltoideae, sub-acutae, glabrae, ciliolatae. *Bracteola* 5,8-6 mm longa, 1,8-2,8 mm lata, elliptica, obtusa,  $\pm$  glabra, ciliata. *Tubus perianthii* 5 mm longus, in super villosus, in medio connatus, ad basim glaber. *Unguis* 4 mm longus, pubescens. *Limbus* 1,5 mm longus, pubescens. *Staminodium* 0,5 mm longum, lineare, decumbens. *Stigma* 0,9 mm lon-

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FIG. 1  
*Leucadendron olens* Williams. Male (left) and female (right) branches.



(1) male inflorescence ( $\times 3$ ); (2) male flower ( $\times 5$ ); (3) basal bract ( $\times 4$ ); cross section through male inflorescence; (5) male floral bract ( $\times 2$ ); (6) female inflorescence ( $\times 3$ ); (7) female flower ( $\times 3$ ); (8) gynoecium ( $\times 3$ ); (9) basal bract ( $\times 2$ ); (10) cross-section through female inflorescence ( $\times 3$ ); (11) female floral bract ( $\times 2$ ); (12) fruit ( $\times 3$ ).

gum, 1,2 mm latum, bifidum. *Stylus* 7,5 mm longus, filiformis, rectus, glaber. *Ovarium* 1,4 mm longum, 1,2 mm diam., globosum, ad apice dense villosum. *Squamae hypogynae* nullae. *Receptaculum* 2 mm diam., globosum. *Strobilus maturus* 17 mm longus, 8 mm diam., conico-ovoideus, glaber. *Nux* 5,5 mm longa, 2,2 mm lata, villosa apicem versus.

*Type:* CAPE—3322 (Oudtshoorn): Modderasskloof, north side of the Outeniqua Mountains, George Division (-CD), 590 m (1950 ft.) alt., 25/6/1980, *Williams 3031* (NBG, holotype; K, PRE, BOL, STE, S, MD, M, isotypes).

*Shrubs* about 1,2 m tall, erect, with a reddish hue, single stemmed at base. *Branches* erect, rod-like, thinly adpressed pubescent becoming glabrescent, reddened, leaves persisting. *Branchlets* clustered, slender, erect, thinly adpressed pubescent, partly hidden by the leaves. *Leaves* similar in both sexes, 7–11 mm long, 1,2–2 mm broad, linear-lanceolate, acute, mucronate, glabrous, coriaceous, sparsely villous-ciliate at first, alternate, adpressed erect, incurved. *Male inflorescence* 9 mm long, 8 mm diam., solitary, terminal, globose, yellow, very sweetly scented. *Involucral leaves* not conspicuous, similar to the stem leaves, about 5 in number. *Basal bracts* varying in size, one measured 4,2 mm long, 3,3 mm broad, concave, ovate, ciliate, glabrous. *Floral bract* 5 mm long, 1,2 mm broad, linear-spathulate, ciliate above but not at the apex, midrib villous. *Perianth tube* 4 mm long, crisped pubescent, connate with the style. *No hypogynous scales*. *Claw* c. 1,7 mm long, pubescent, recurved, connate with the filament. *Limb* 1,7 mm long, linear, glabrous towards the apex. *Anther* 1 mm long, linear, soon devoid of pollen. *Pollen* triangular with pores at the apices and sides 42  $\mu$  long, not sticky. *Stigma* abortive, 1,5 mm long, clavate, minutely bifid, does not act as a pollen presenter. *Style* 2 mm long, filiform, becoming deflexed, connate with the perianth tube below. *Male bud* 6,5 mm long, somewhat thickened above, apex glabrous, densely crisped pubescent below. *Receptacle* 1,8 mm diam., globose. *Female inflorescence* 5 mm diam., solitary, terminal, conic-ovoid, glabrous, surrounded by a few narrow involucral leaves with 2 or 3 yellow flowers projecting at the apex showing their large bifid stigmas. *Basal bracts* numerous, varying in size, one measured 6 mm long, 6 mm broad at base, deltoid, sub-acute, ciliolate, glabrous. *Floral bract* 5,8–6 mm long, 1,8–2,8 mm broad, elliptic, obtuse, ciliate, glabrous except for a few long silky hairs, standing in a tuft of long silky hairs at the base. To either side are to be found long narrow pubescent sterile bracts. *Perianth tube* 5 mm long, villous above, glabrous below, connate in the middle. *Claw* 4 mm long, pubescent, recurved more than 180°. *Limb* 1,5 mm long, lanceolate-obtuse, pubescent, apex hooked in. *Staminodes* 0,5 mm long, linear, decumbent. *Stigma* 0,9 mm long, 1,2 mm broad, bifid, edges revolute. *Style* 7,5 mm long, filiform, erect, glabrous. *Ovary* 1,4 mm long, 1,2 mm diam., globose, densely clothed in the upper half with long

silky hairs. *No hypogynous scales.* Fruit a cone 17 mm long, 8 mm diam., conic-ovoid, glabrous with the bracts red-tipped, 2 or 3 seeds ripening in each fruit. Seed a hard nutlet 5.5 mm long, tufted at the apex making it 8.5 mm overall, 2.2 mm broad, becoming 4-ribbed and glabrous at the base.

As far as is known this species had not been collected until the author and his family came across it by accident whilst examining a population of *Leucadendron ericifolium* along the forestry track in an area known as Modderasskloof on the north side of the Outeniqua Mountains to the west of the farm Waboomskraal near George. The whole area for many kilometres is overrun with *Hakea sericea* which is a very serious threat to the indigenous vegetation. Immediate action by the Department of Forestry will be required if this very interesting and unique new *Leucadendron* is to be preserved. There is no other species of *Leucadendron* which has flowers as sweet smelling as those of the male *L. olens*. In fact it can rank on a par with those other species of sweet-smelling flowers whose perfume will pervade a whole room.

In 1972 when a monograph on *Leucadendron* was published, the species *L. ericifolium* was thought to be extinct. Since then however it has been discovered growing on the Rooiberg in the Little Karoo to the north of the Langeberg and all along the north side of the Attaquas and Outeniqua mountains between the Gouritz River and George.

#### SPECIMENS EXAMINED

Type only. As above.

#### DISTRIBUTION, BIOLOGY AND VARIATION

As far as is known *L. olens* is found growing only along the north slopes of the Outeniqua Mountains between the headwaters of the Groot Doring and Klein Doring rivers over a distance of about 4 km at altitudes of from 590 to 790 m above sea level. It grows upon dry stony gravelly slopes derived from the Table Mountain Sandstone, the surface often strewn with blackish stones. The yellow flowering male plants are quite conspicuous when in bloom.

Of all species of *Leucadendron*, *L. olens* is most closely related to *L. ericifolium* R.Br. but appears to be somewhat less specialised. Both plants would seem to be anemophilous neither having hypogynous scales and therefore no nectar to attract insects. In both cases the pollen is not sticky and can be dispersed by the wind. The abortive stigma in the male does not act as a pollen presenter. In both species the female stigma is very large and protrudes prominently. However the male inflorescence in *L. olens* being larger and possessing many more flowers is not as much reduced as in *L. ericifolium*. It does, none the less, still retain the ability to produce a very fragrant perfume which may be a survival from the time when the species was pollinated by insects. In *L. olens* the num-

ber of flowers in the female head is about three but in *L. ericifolium* this has been reduced to only one. In *L. olens* all leaves are similar in shape but in *L. ericifolium* one finds ericoid leaves towards the base of the plant and flattish linear leaves above that are considerably smaller in the male plants.

No significant variation had been noted in those populations of *L. olens* that have been examined but one or two putative hybrids with *L. ericifolium* have been seen (Williams 3028). These show characters which are intermediate between those of the putative parent species. These putative hybrids bear slender branchlets with ericoid leaves towards the base of the plant as in *L. ericifolium*, a character not seen in *L. olens*.

#### PUTATIVE HYBRIDS

*L. ericifolium* R.Br.  $\times$  *L. olens* Williams, male and female.

CAPE—3322 (Oudtshoorn): Modderasskloof, north side of the Outeniqua Mountains, George Division (-CD), 590 m alt., 15/7/1980, Williams 3028 (NBG, BOL, PRE).

#### DISCUSSION

In the arrangement of species adopted in the *Revision of the Genus Leucadendron* (Williams, 1972), *L. olens* with its nut-like seed should be placed in the section *Leucadendron*, sub-section *Uniflora*.

*Leucadendron olens* is recognised as a distinct species having monomorphic leaves, the male flower head 9 mm in diam., bright yellow and fragrant and with the female head 5 mm in diam., conic-ovoid, glabrous with 2 or 3 flowers at the apex. It differs from *L. ericifolium* which is a much taller plant with dimorphic leaves having very small and numerous male heads and silvery pubescent female heads bearing only one flower at the apex. The name refers to the fragrant flowers of the male plant.

#### REFERENCE

- WILLIAMS, Ion J. M., 1972. A Revision of the Genus *Leucadendron* (Proteaceae). *Contr. Bol. Herb.* 3: 105